

**ABSTRACT OF THE DISCLOSURE**

Test tubes with different dielectric properties are used for holding different samples/solvents within a nuclear magnetic resonance (NMR) probe of an NMR spectrometer. The test tube dielectric properties are chosen such that the overall capacitance seen by the NMR probe coils remains constant as different samples and test tubes are inserted into the probe. Samples having different solvents introduce substantially equal frequency shifts into the measurement circuitry. The disclosed systems and methods facilitate automated NMR measurements, and do not require specialized electronic or moving mechanical components for tuning compensation.